IT Architecture

Case Study: Establishing Federated Information Technology (IT) Architectures at the Department of Commerce & National Oceanic and Atmospheric Administration

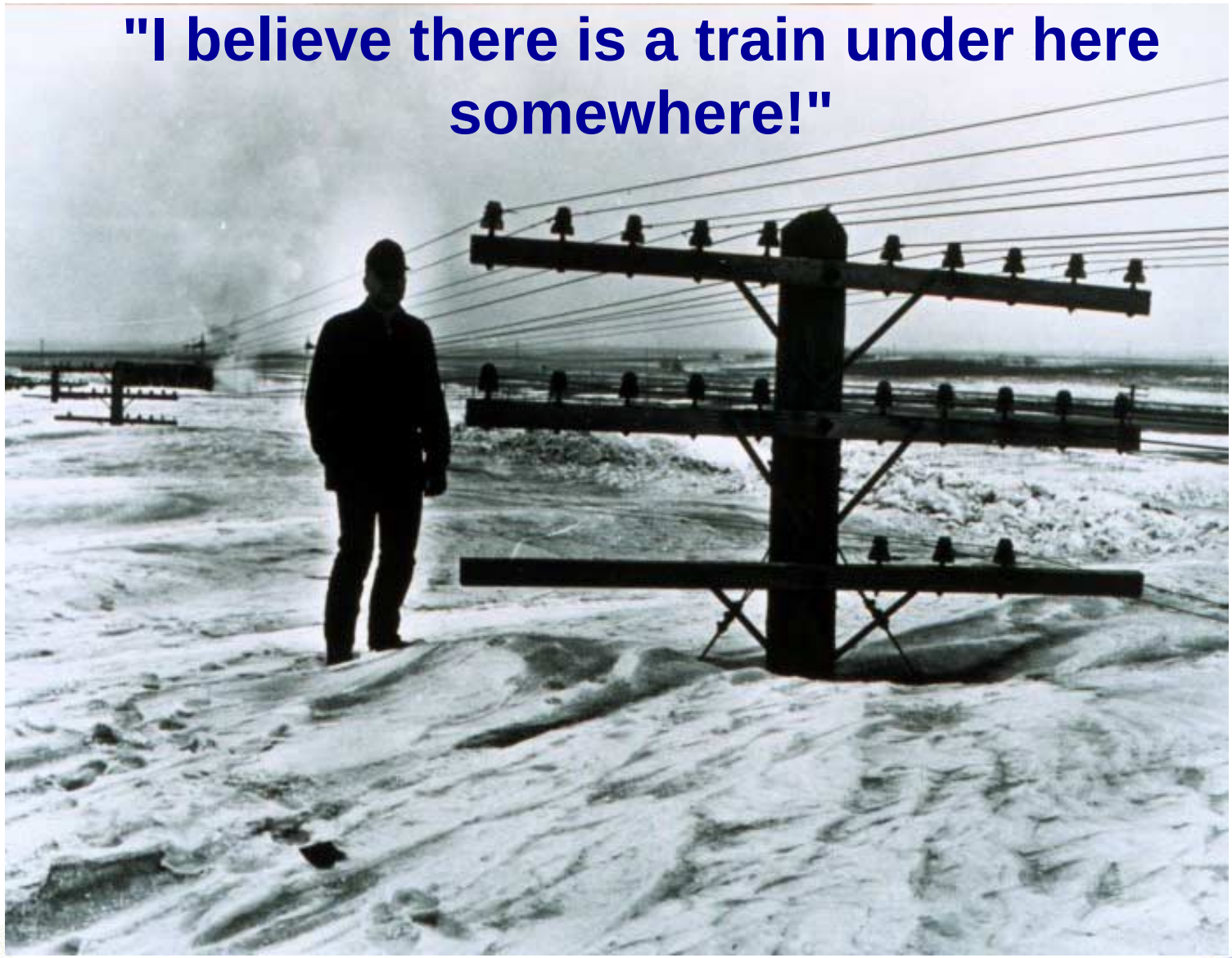
Ira M. Grossman

NOAA IT Architect

May 17, 2001

IT Architecture

"I believe there is a train under here somewhere!"



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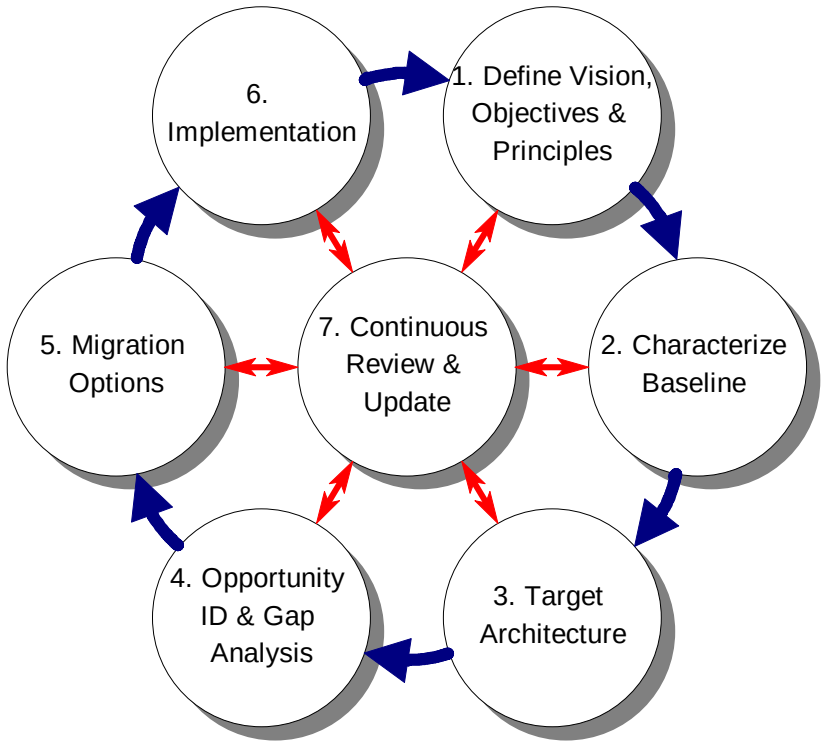
IT Architecture

Department of Commerce IT Architecture



http://www.hpcc.noaa.gov/docita

Disclaimer: The opinions expressed in this presentation are solely those of the speaker and are not those of the Department of Commerce or the National Oceanic and Atmospheric Administration.

Objectives of Presentation

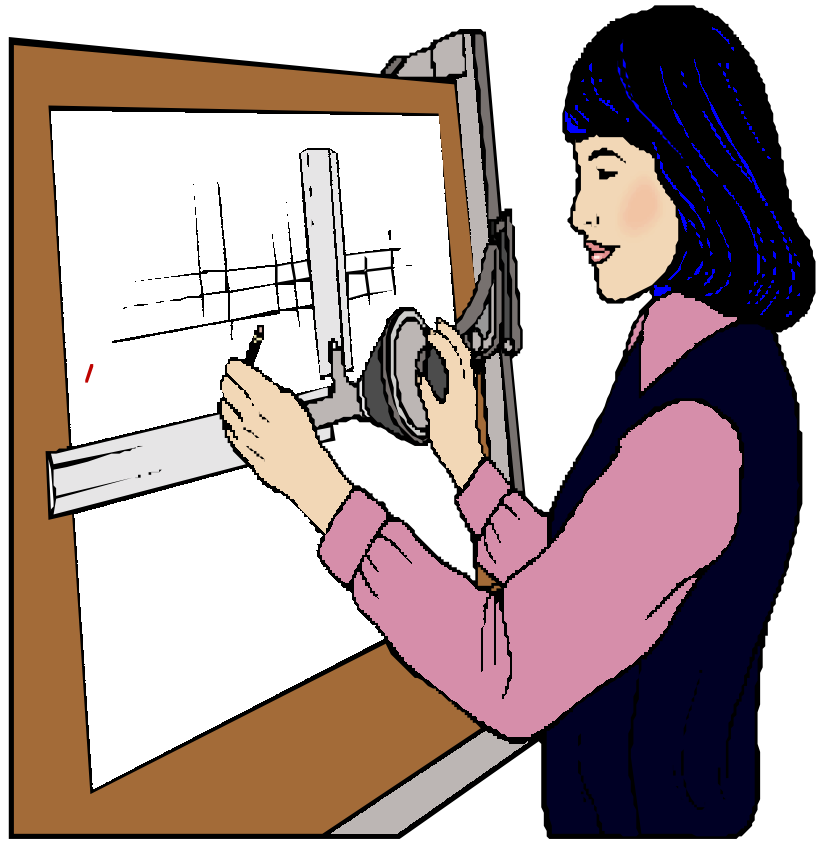
- How to establish a Federated IT Architecture hierarchal structure
- Learn how to establish a Federated IT Architecture governance process
- The role of a Technical Reference Model and Standards Profile in a Federated IT Architecture
- The role of an IT Architecture Capability Maturity Model in a Federated IT Architecture
- Apply lessons learned from two Federated IT Architecture efforts

Outline

- **What is an IT Enterprise Architecture?**
- Department of Commerce IT Architecture
- DoC Technical Reference Model and Standards Profile
- DoC IT Architecture Capability Maturity Model
- Lessons Learned

What is an IT Architecture?

- A blueprint that explains how all the Information Technology and Management elements work together as a whole



What is an IT Architecture?

- Provides explicit description of the current and desired **relationships among business and management processes and Information Technology**
- An IT Architecture contains two elements:
  - **An Enterprise Architecture**
  - **A Technical Reference Model and Standards Profile**

OMB Circular A-130, Management of Federal Information Resources, November 28, 2000

What is an IT Architecture?

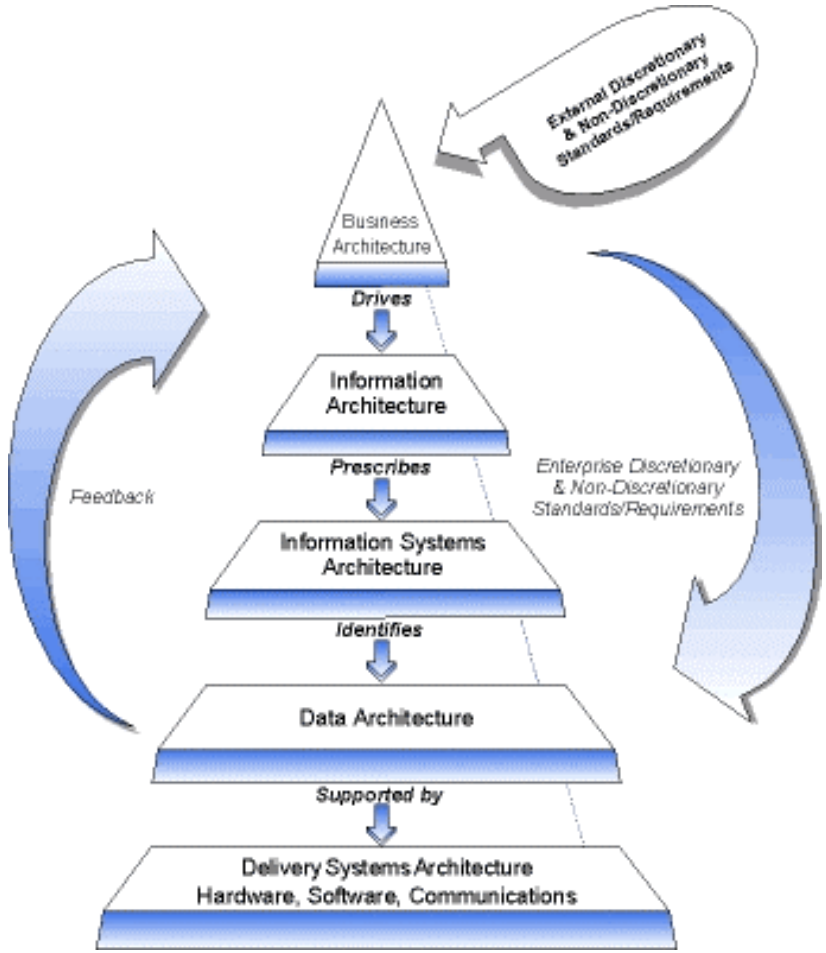
- Describes the **Current Architecture** and **Target Architecture**
- Provides a **strategy** to support current state
- Acts as a **roadmap** for transition to target environment
- **Defines principles and goals**
- **Sets direction**
- Include Agency's **capital planning and investment control processes**

OMB Circular A-130, Management of Federal Information Resources, November 28, 2000

What is an IT Architecture?

- IT Architecture Components
  - Business Process
  - Information Flows and Relationships
  - Applications
  - Data Descriptions
  - Technology Infrastructure

OMB Circular A-130, Management of Federal Information Resources, November 28, 2000



NIST Special Publication 500-167, Information Management Directions: The Integration Challenge" September, 1989

What is an IT Architecture?

Department of Commerce

IT Architecture Views

- **Business Process**
- **Data/Information**
- **Applications**
- **Technology Infrastructure** (networks, telecommunications & computer platforms)

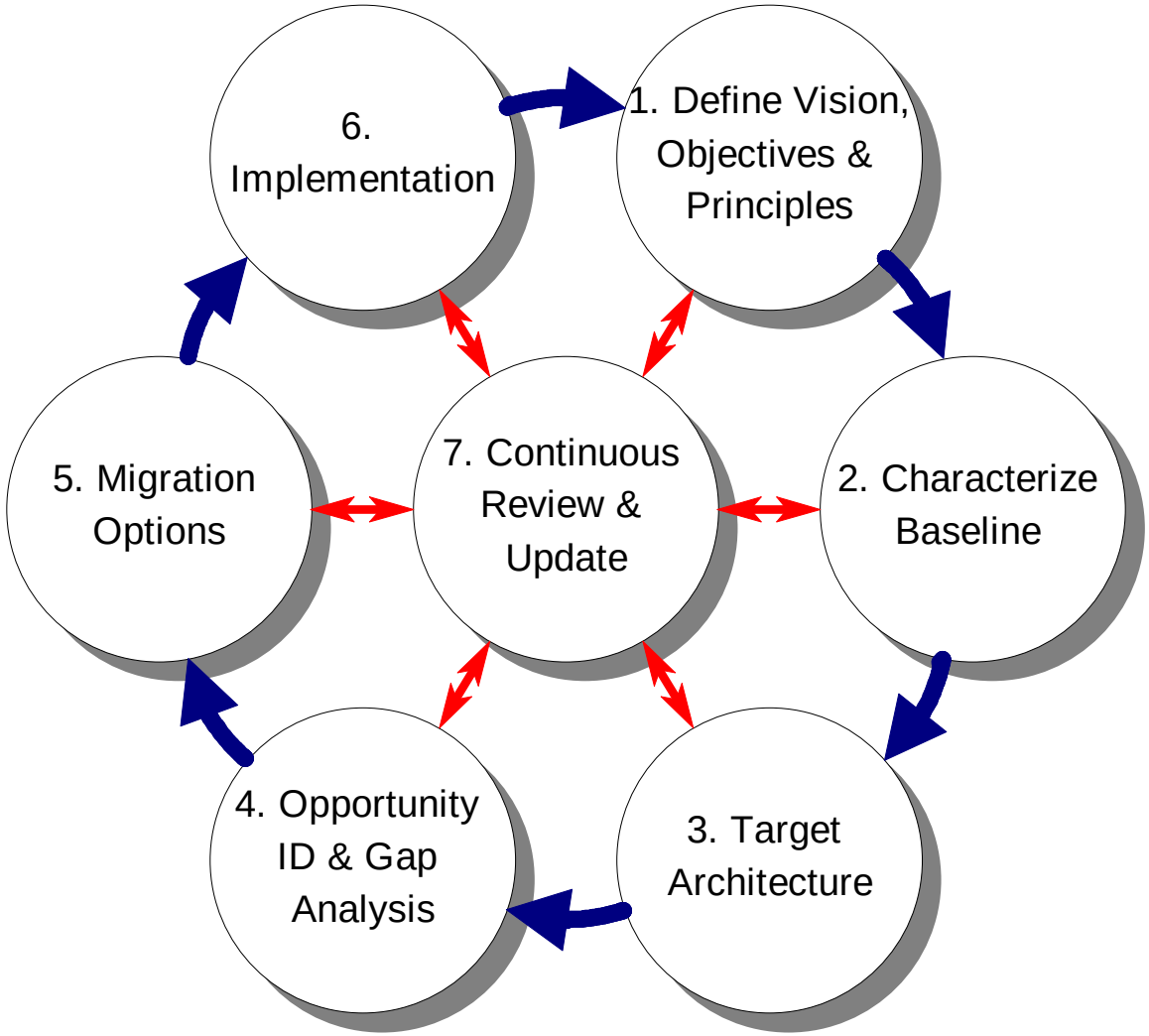
What is an IT Architecture?

IT Architecture Describes:

- The way **Work** activities are organized and the **Locations** where the work is carried out
- The **Information Sets/Databases** needed to perform the work
- The **Applications/Software** that capture and manipulate the information sets
- The **Technology Infrastructure** (hardware, network and communications) needed to run the applications

IT Architecture

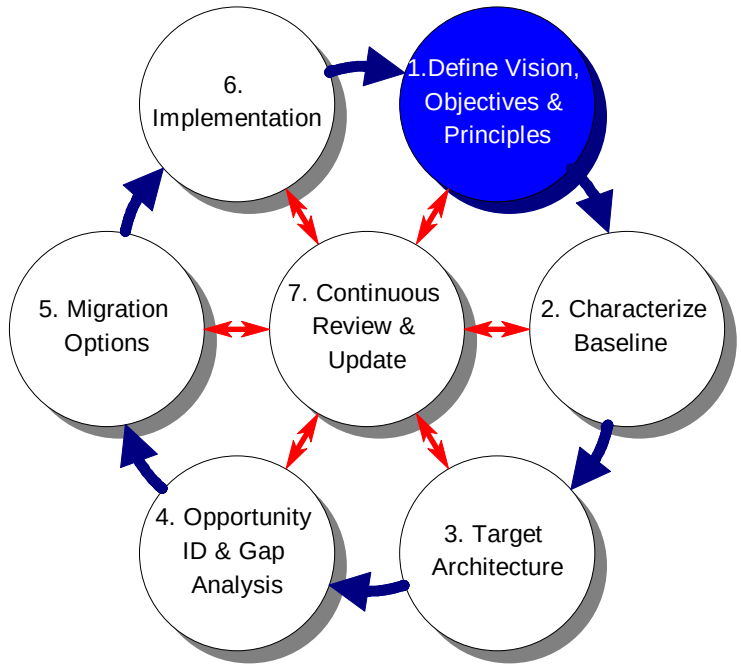
DoC IT Architecture Process Model



IT Architecture

1. Define IT Vision, Objectives and Principles

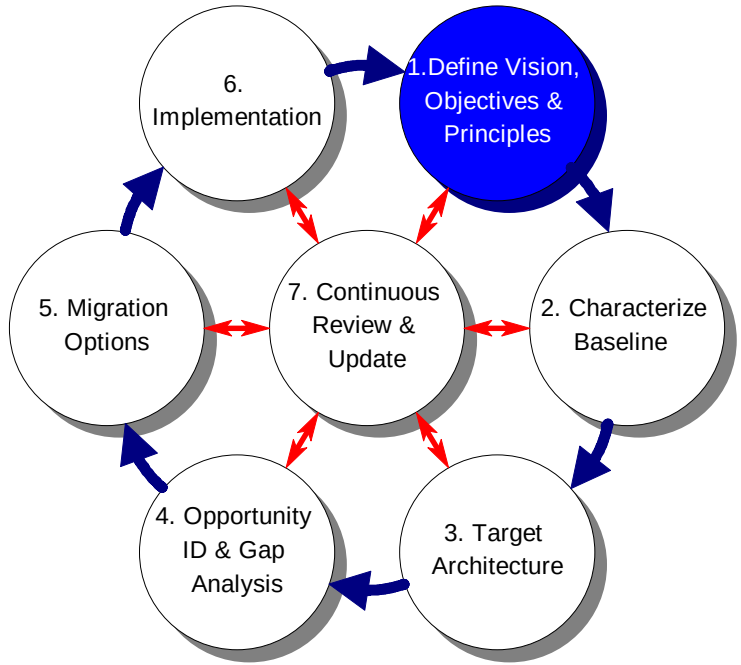
- Establish process, scope teams and budget
- Determine business drivers
- Develop IT Vision and Objectives
- Develop IT Principles
- Ascertain IT requirements and best practices



IT Architecture

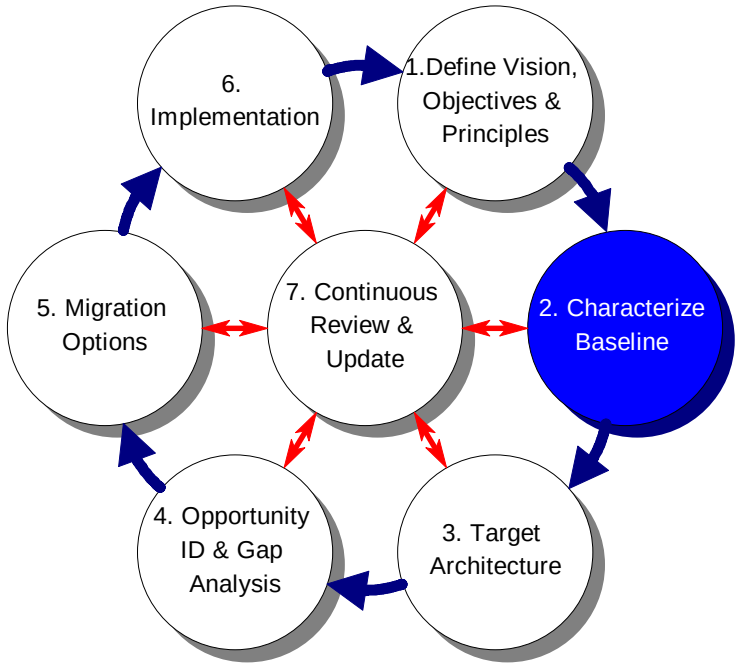
1. Define IT Vision, Objectives and Principles

- Align the IT Architecture with strategic plan.
- Establish IT Architecture Vision.
- Clearly state and establish IT Architecture Principles for all IT Architecture views
- Define IT Requirements
- Link the IT Architecture to the IT Capital Planning process.
- Document Step 1 Activities



2. Characterize IT Baseline

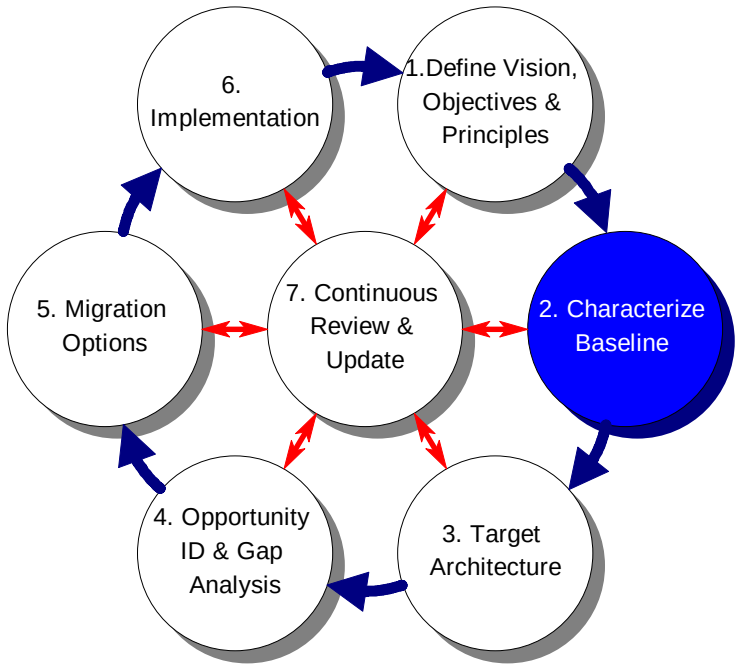
- Establish baseline
- Gather data
  - Conduct interviews
  - Use written surveys and workshops
- Compile information into database
- Condense information into summary report(s)
- *Deliverable: Baseline Characterization Document*



IT Architecture

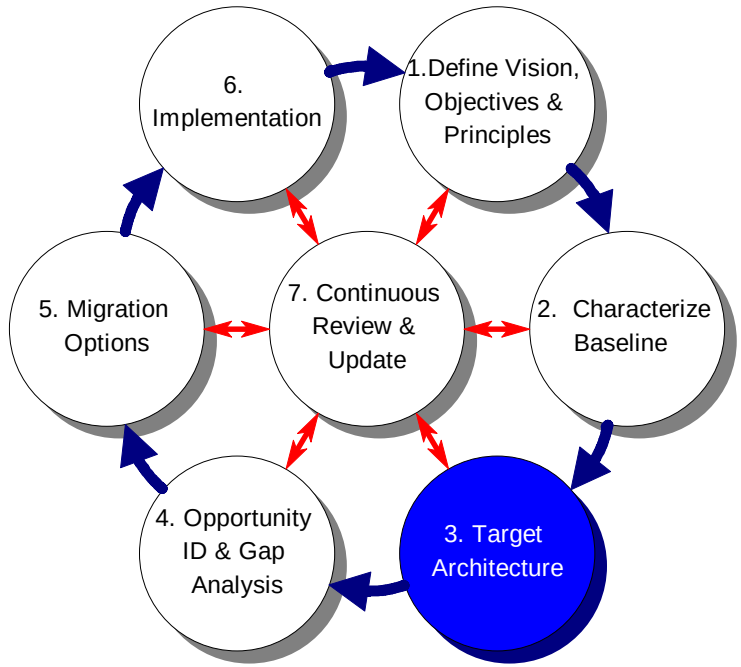
2. Characterize IT Baseline

- Develop an inventory (IT Baseline) of existing Information Sets, Databases, Applications and Technology Infrastructure.
- Identify the information and data flows within the bureau and with constituents and collaborators.
- Document Step 2 Activities



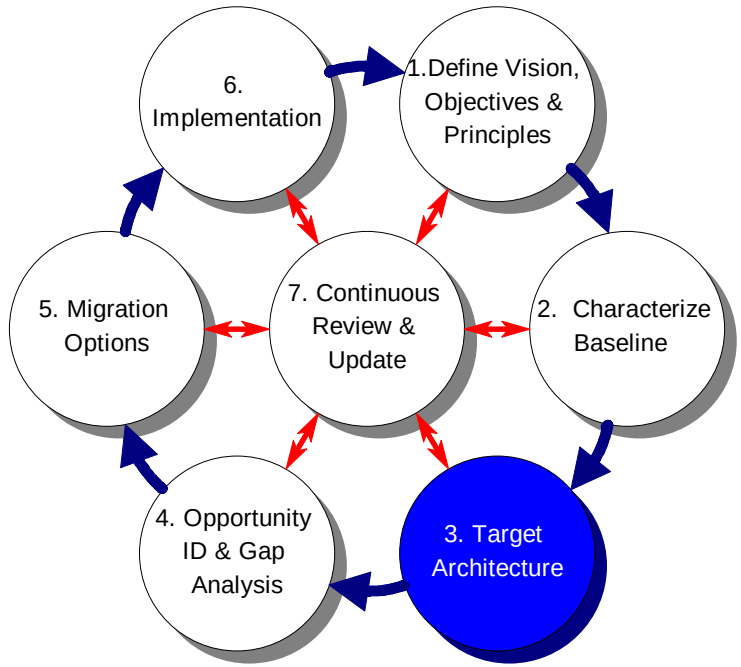
3. Create IT Target Architecture

- Model each view separately
- Identify the Technology Drivers
- Create a Target Architecture for each of the four IT Architecture views.
- Synthesize four views into a comprehensive Target Architecture
- Start Technical Reference Model and create Standards Profile
- *Deliverables:*
  - *Target Architecture Document*
  - *Technical Reference Model*
  - *Standards Profile*



3. Create IT Target Architecture

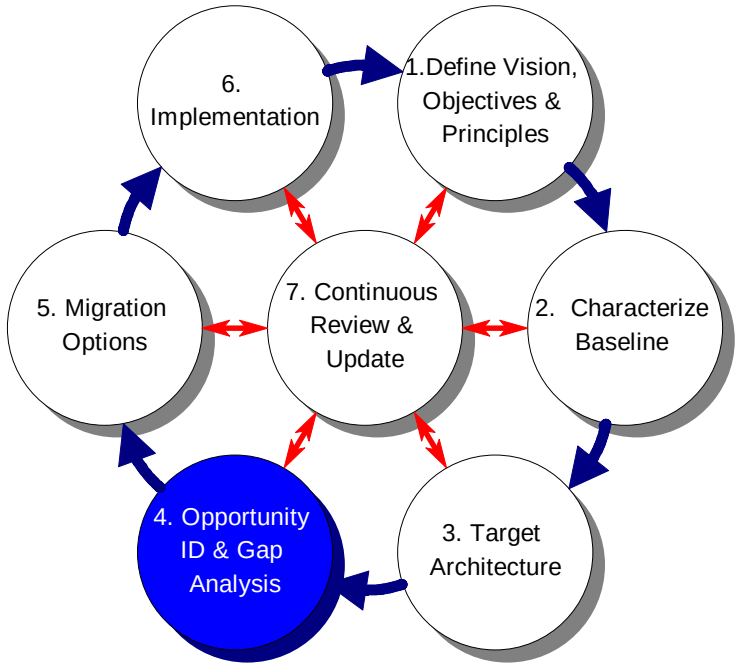
- Align the IT Target Architecture with the Department's Digital Department.
- Develop a Technical Reference Model and Standards Profile
- Link new IT Target Architecture initiatives to the IT Capital Planning process.
- Document Step 3 Activities



IT Architecture

4. Identify Immediate and Future Opportunities & Perform Gap Analysis

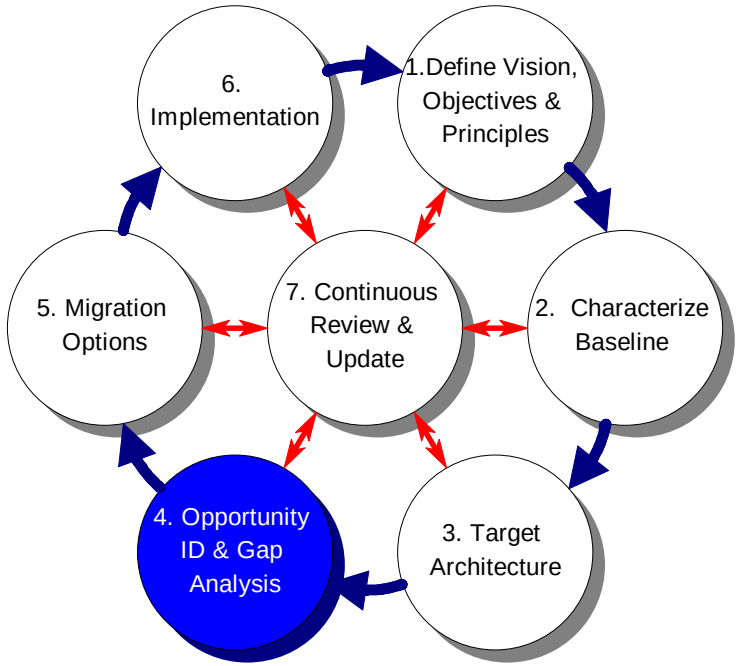
- Identify all projects necessary to achieve the Target Architecture
- Identify **short-term** immediate opportunities
- Verify immediate opportunities as low cost **quick-win projects**
- Develop Gap Analysis
- *Deliverable: Opportunity Identification Document*



IT Architecture

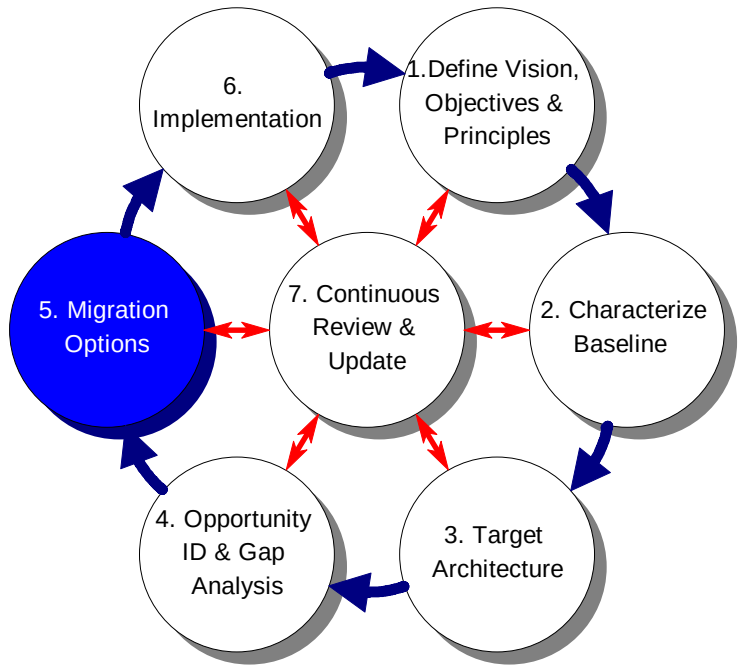
4. Identify Immediate and Future Opportunities & Perform Gap Analysis

- Identify all projects necessary to achieve the IT Target Architecture.
- Perform a Gap Analysis.
- Identify short-term immediate opportunities.
- Identify short term immediate opportunities that can result in visible ‘quick-win’ projects.
- Document Step 4 Activities



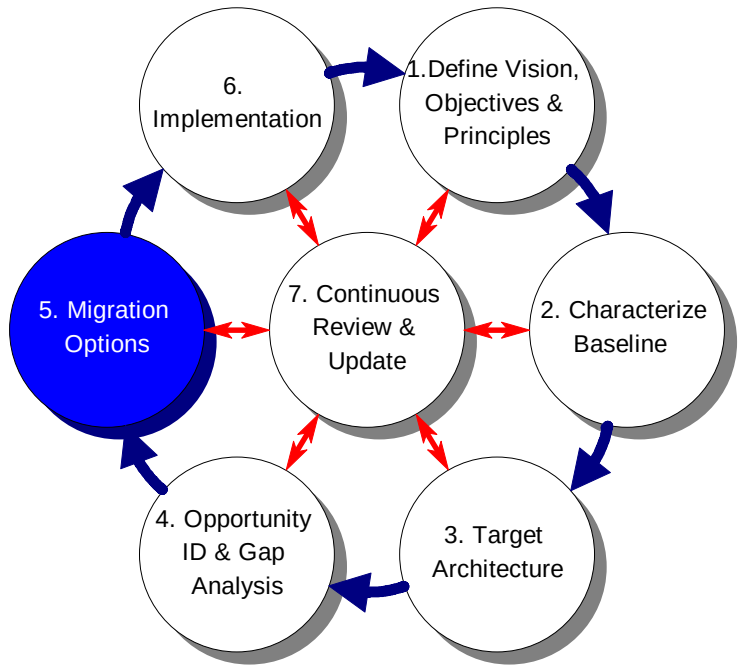
5. Develop Migration Options

- Establish one or more plateaus
  - Short, medium and long range objectives and priorities
- Prioritize projects
  - Inter-project dependencies
  - Cost/benefit analyses
- Perform alternative analyses
- *Deliverable: Migration Options & Implementation Plan Document*



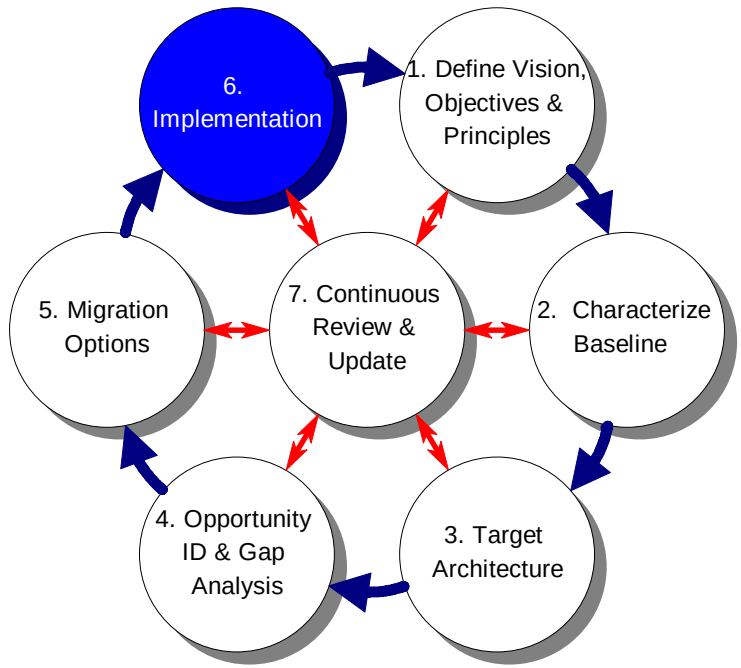
5. Develop Migration Options

- Classify all projects as short (6 - 18 months), medium (18 - 36 months)and long (3 - 5 years) range.
- Prioritize within each classification (short, medium and long range), all projects
- Establish and document Data Dictionaries, Software Developmental Methodologies and Configuration Management Processes.
- Develop an IT Architecture Migration Plan.
- Document Step 5 Activities.



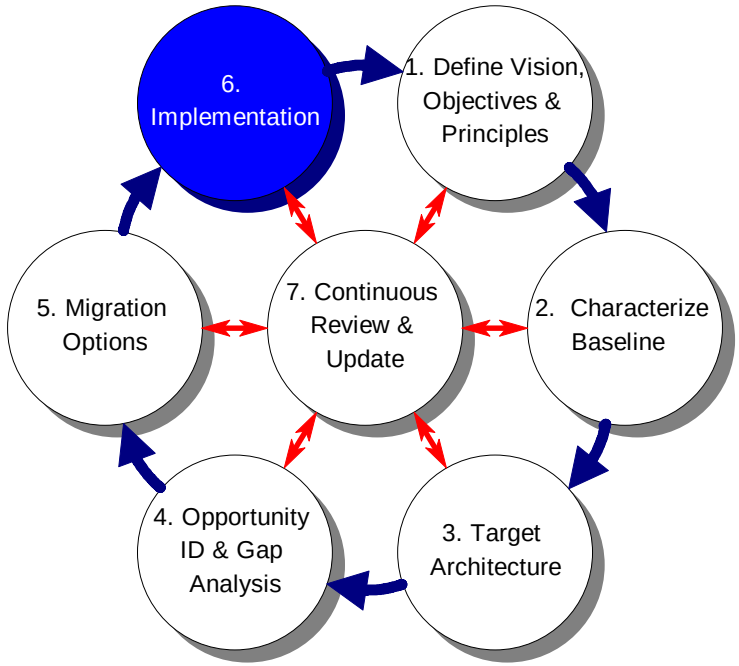
6. Implement IT Target Architecture

- Implement first wave of projects
- Establish the groundwork for each successive plateau implementation
- Establish responsibilities to ensure that the projects are carried out
- Update Migration Plan
- *Deliverables: Completion of IT projects & corresponding documents*



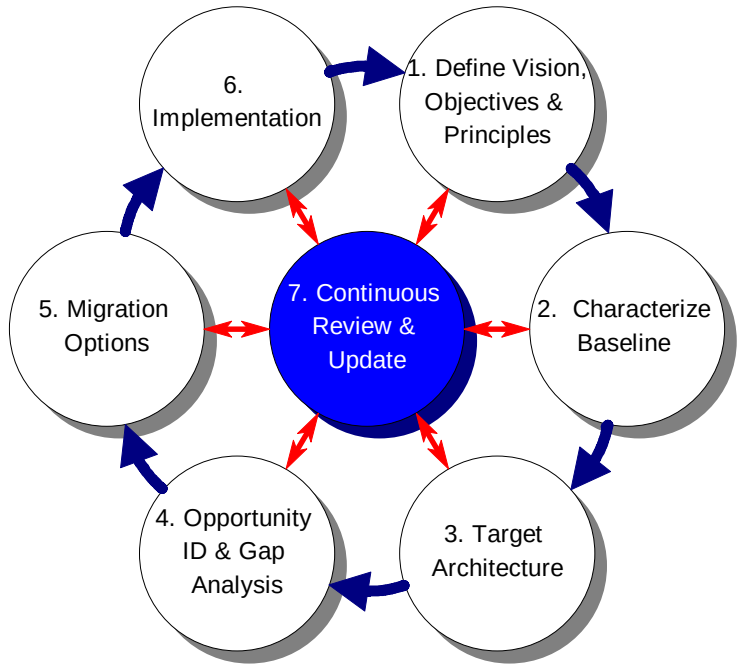
6. Implement IT Target Architecture

- Identify an IT Architecture project leader for each IT Architecture project to be implemented.
- Establish roles and responsibilities for IT Architecture project implementation.
- Establish a project plan and milestone schedule for each project.
- Document Step 6 Activities.

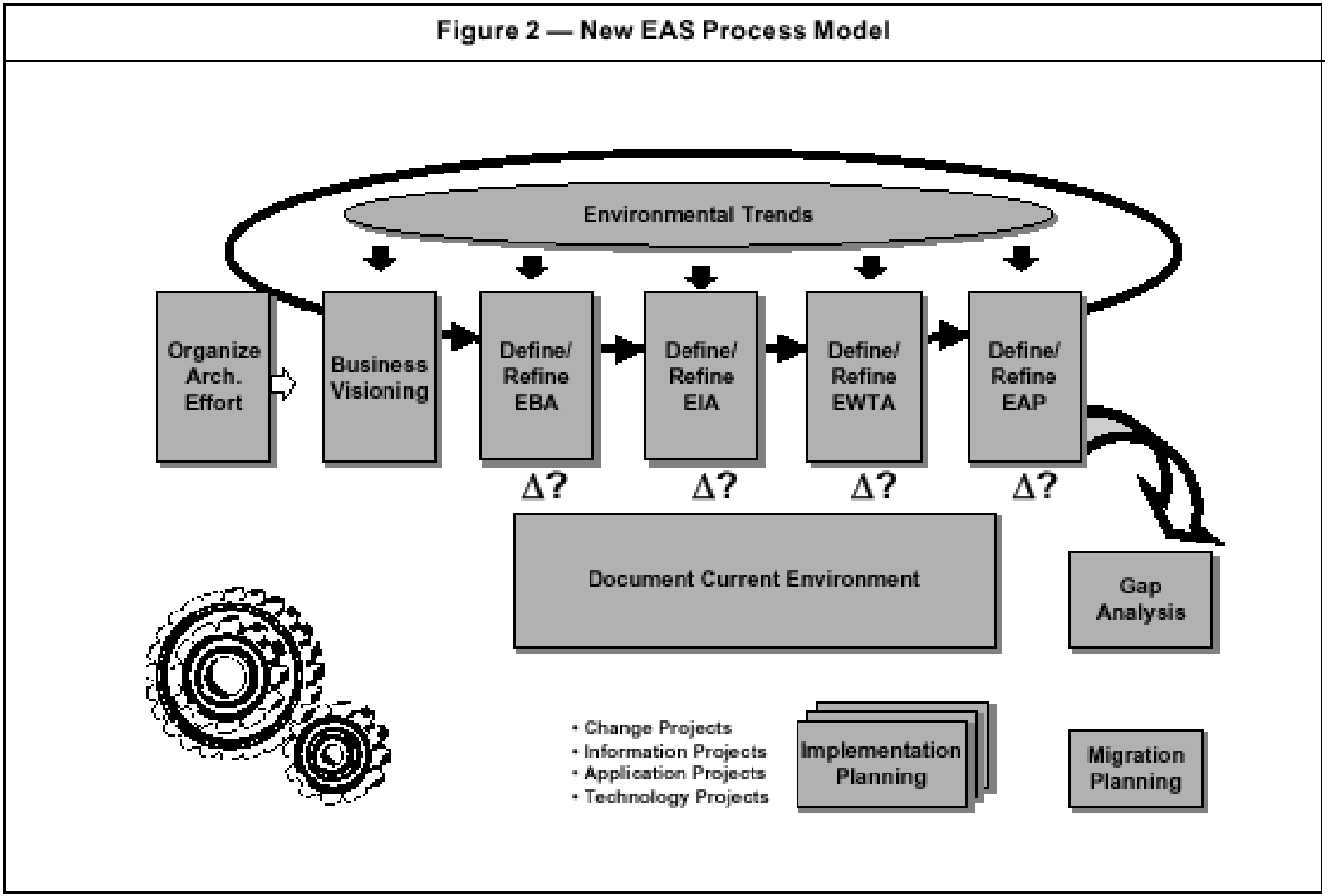


7. Continuously Review and Update IT Enterprise Architecture

- Adjust the IT Enterprise Architecture decisions for unforeseen changes
- Make adjustments based on experience
- Ensure modifications reflect a realistic approach
- **Can cause a reentry into the process at any point**
- Update IT Architecture, annually



META EAS Process Model



Outline

- What is an IT Enterprise Architecture?
- **Department of Commerce IT Architecture**
- DoC Technical Reference Model and Standards Profile
- DoC IT Architecture Capability Maturity Model
- Lessons Learned

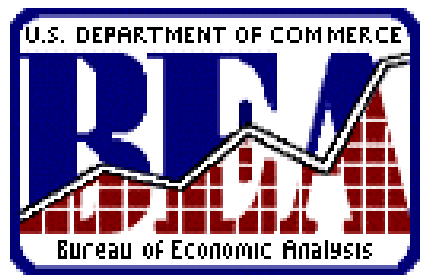
What Is a Federated IT Architecture?

- Federated Architecture[1] – Defines common or shared architecture standards (and IT Principles) across lines of business (LOBs)
- Enables LOBs to maintain diversity and uniqueness, while providing interoperability
  - LOBs have full autonomy to develop standards for applications and infrastructure and to define architectures
  - LOB goal is to optimize performance at LOB level

[1] **META Delta 46, "Federated Architectures: Integrating Autonomous LOBs", March 1, 1999**

IT Architecture

This is the Department of Commerce



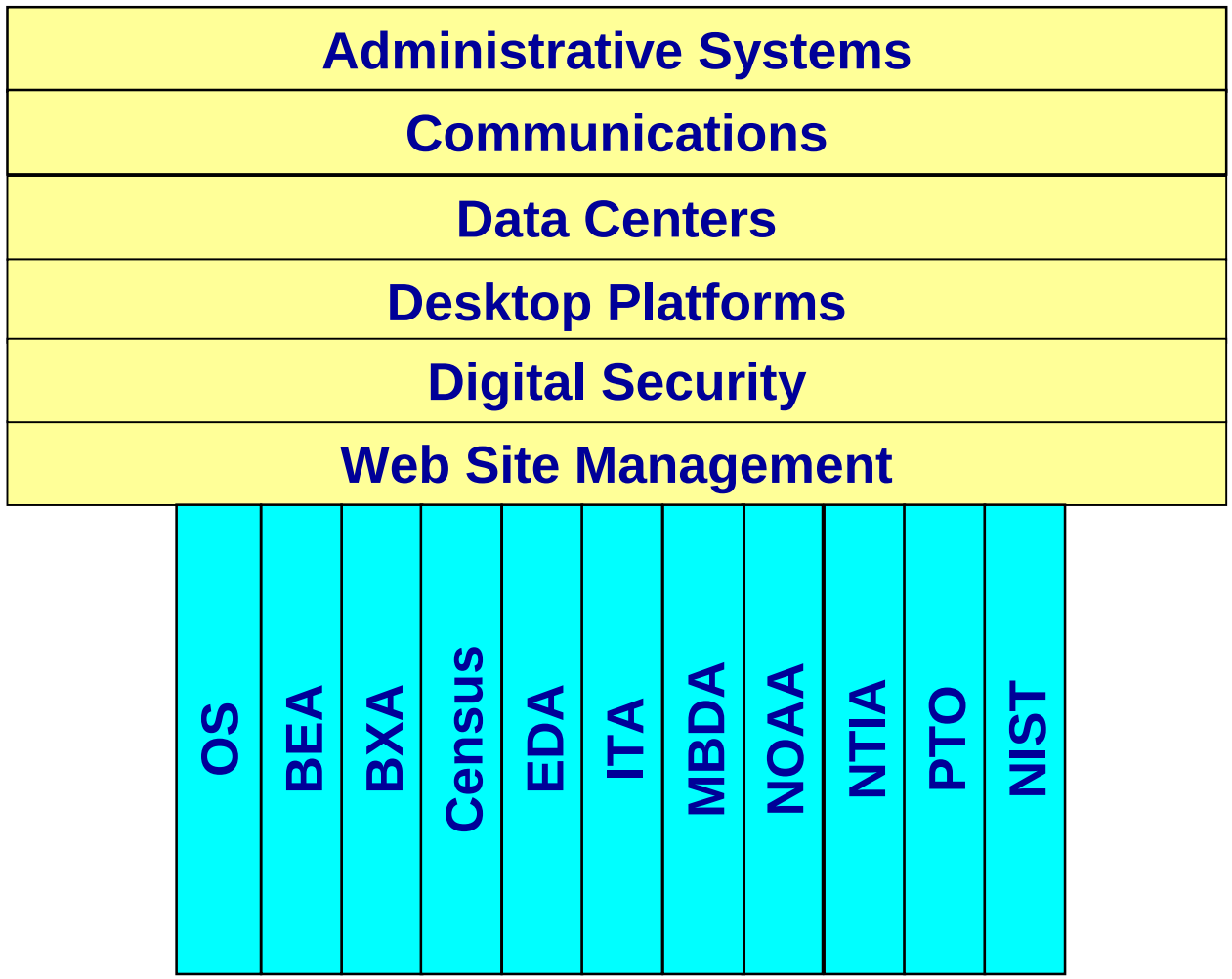
Department of Commerce Organizations

- Office of the Secretary
- Bureau of Export Administration
- Economics and Statistics Administration
  - Bureau of Economic Analysis
  - Bureau of the Census
- Economic Development Administration
- International Trade Administration
- Minority Business Development Agency
- National Oceanic & Atmospheric Administration
- National Telecommunications & Information Administration
- Office of Inspector General
- Patent and Trademark Office
- Technology Administration
  - National Institute of Standards & Technology
  - National Technical Information Service
  - Office of Technology Policy

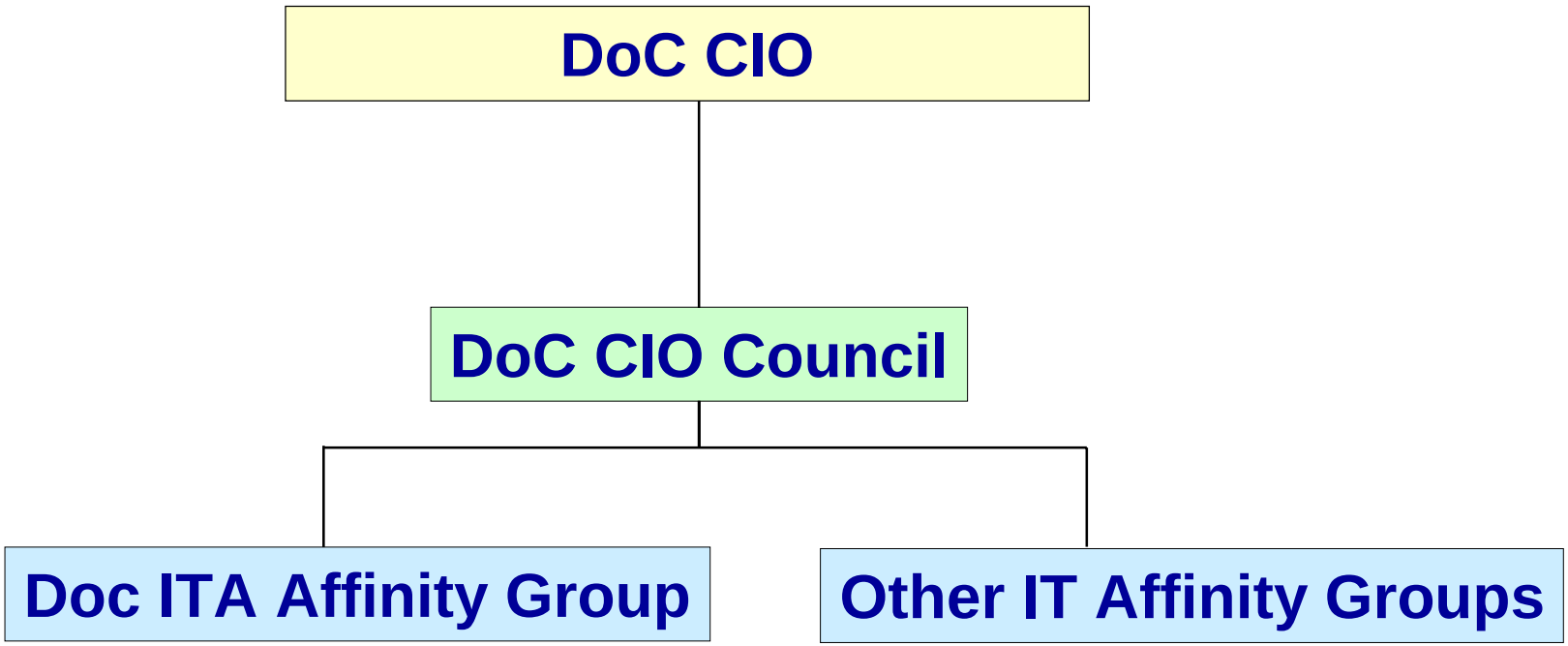
IT Architecture

Dept of Commerce Federated IT Architecture (Draft)

IT Architecture = DoC-wide Domains+ Operating Unit Segments



DoC IT Architecture Governance Structure



DoC IT Architecture Affinity Group

- Chartered by CIO Council as a resource to help develop IT Architecture throughout the Department by providing guidance and making recommendations on Operating Unit efforts

- DoC IT Architecture Affinity Group
  - Bureau of the Census
  - Bureau of Economic Analysis
  - Bureau of Export Administration
  - International Trade Administration
  - National Institute of Standards & Technology
  - National Oceanic & Atmospheric Administration
  - National Telecommunications & Information Agency
  - Office of the Chief Information Officer
  - U. S. Patent and Trademark Office

DoC IT Architecture Affinity Group

- Meets every (most) Tuesday morning for 90 minutes
- Held first meeting on January 11, 1999
- Established Charter, and Roles & Responsibilities
- Recorded proceedings in meeting minutes
- Created DoC IT Enterprise Architecture Home Page: **http://www.hpcc.noaa.gov/docita**
- Presented recommendations to CIO Council on March 11, 1999

DoC IT Architecture Affinity Group

- Developed DoC IT Architecture Guidance Documents and Evaluation Checklist
- Developed DoC Technical Reference Model and Standards Profile
- Created DoC IT Architecture Capability Model
- Provide guidance on and review all Operating Unit IT Architectures
- Received Department of Commerce Bronze Medal Award – December 2000

DoC IT Architecture Affinity Group Home Page

IT Architecture Guidance

IT ARCHITECTURE
WHAT IS IT, WHY SHOULD YOU CARE,
AND HOW DO YOU DO ONE?

THE SEVEN STEP PROCESS

One approach to doing IT Architectures

- STEP 1 - DEFINE YOUR VISION, OBJECTIVES, AND PRINCIPLES
- STEP 2 - CHARACTERIZE YOUR IT BASELINE
- STEP 3 - CREATE A TARGET ARCHITECTURE
- STEP 4 - DETERMINE THE GAPS BETWEEN YOUR CURRENT AND TARGET ARCHITECTURES
- STEP 5 - DEVELOP A MIGRATION PLAN
- STEP 6 - IMPLEMENT MIGRATION PLAN AND ARCHITECTURE
- STEP 7 - REVIEW AND UPDATE REGULARLY

IT Architecture

Evaluation Criteria - Architecture Development Checklist

1. Identify **Business Processes** that will be the bases for Architectures
2. Develop basic **ground rules** for the designing, building, acquiring, or re- engineering of IT systems, and document **Architectural Principles**
3. Ensure that the **IT Architecture Principles** and other Architecture efforts are **consistent with** the organization's **Strategic Plan, Strategic IT Plan, and Operational IT Plan**, as well as Departmental goal of "**Electronic - Government**"
4. Characterize and document the **Baseline Architecture** (by Views)

Evaluation Criteria - Architecture Development Checklist

5. Develop a model of what the IT Architecture should be in the future and document as **Target Architecture**
6. Perform a **Gap Analysis** showing where the Baseline Architecture and the Target Architecture differ.
7. Develop a plan to close the gaps between the Baseline and Target Architectures, document as **Migration Plan**
8. Create a **Technical Reference Model and Standards Profile** to guide acquisitions in a way consistent with the Target Architecture and Migration Plan
9. **Begin implementation** of the Migration Plan

IT Architecture

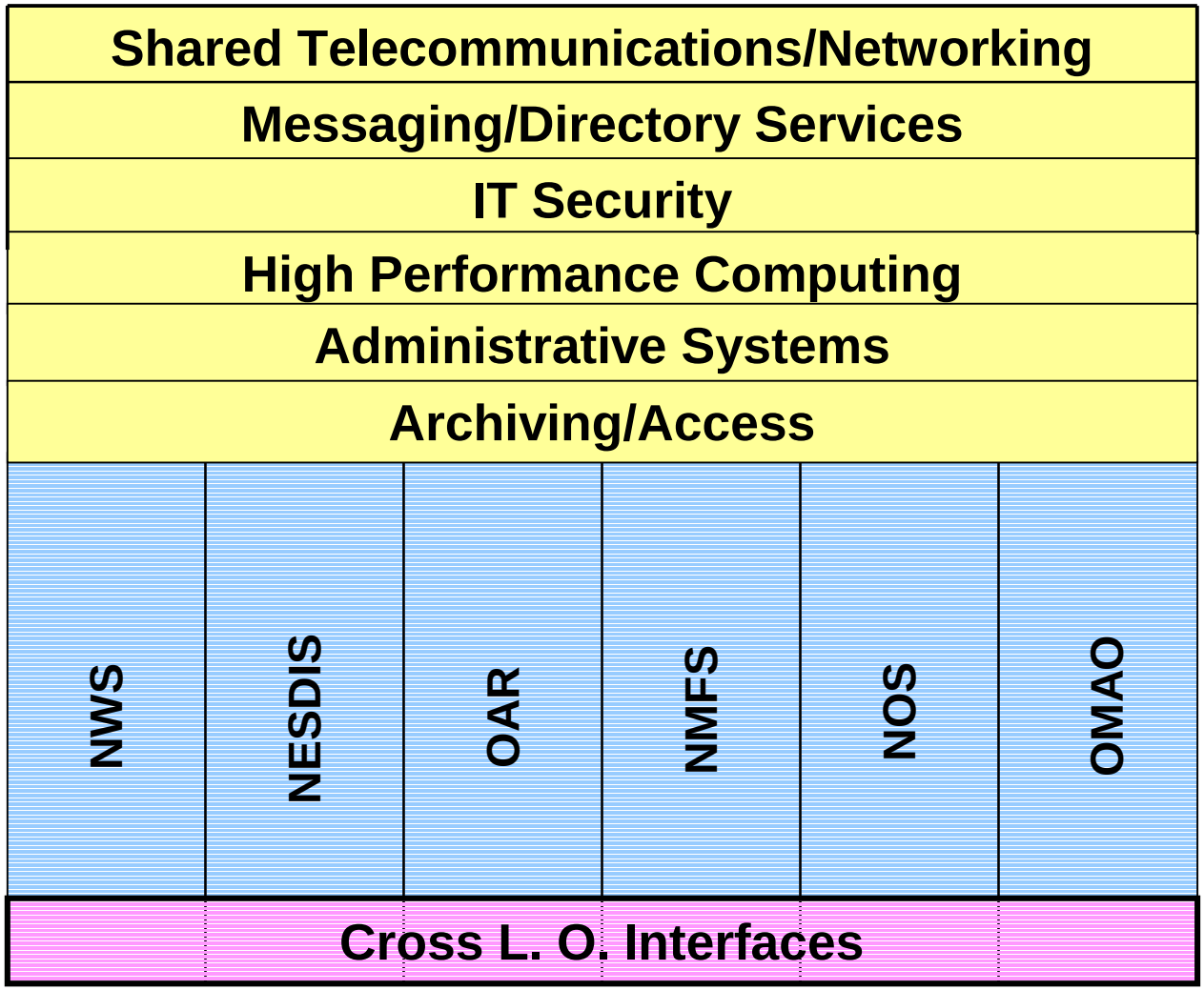
National Oceanic & Atmospheric Administration

- National Weather Service
- National Environmental Satellite, Data & Information Service
- National Marine Fisheries Service
- National Ocean Service
- NOAA Research
- Office of Finance and Administration
- Office of Marine and Aviation Operations

IT Architecture

NOAA Federated IT Architecture

IT Architecture = NOAA-wide Domains+ Line Office Segments



IT Architecture

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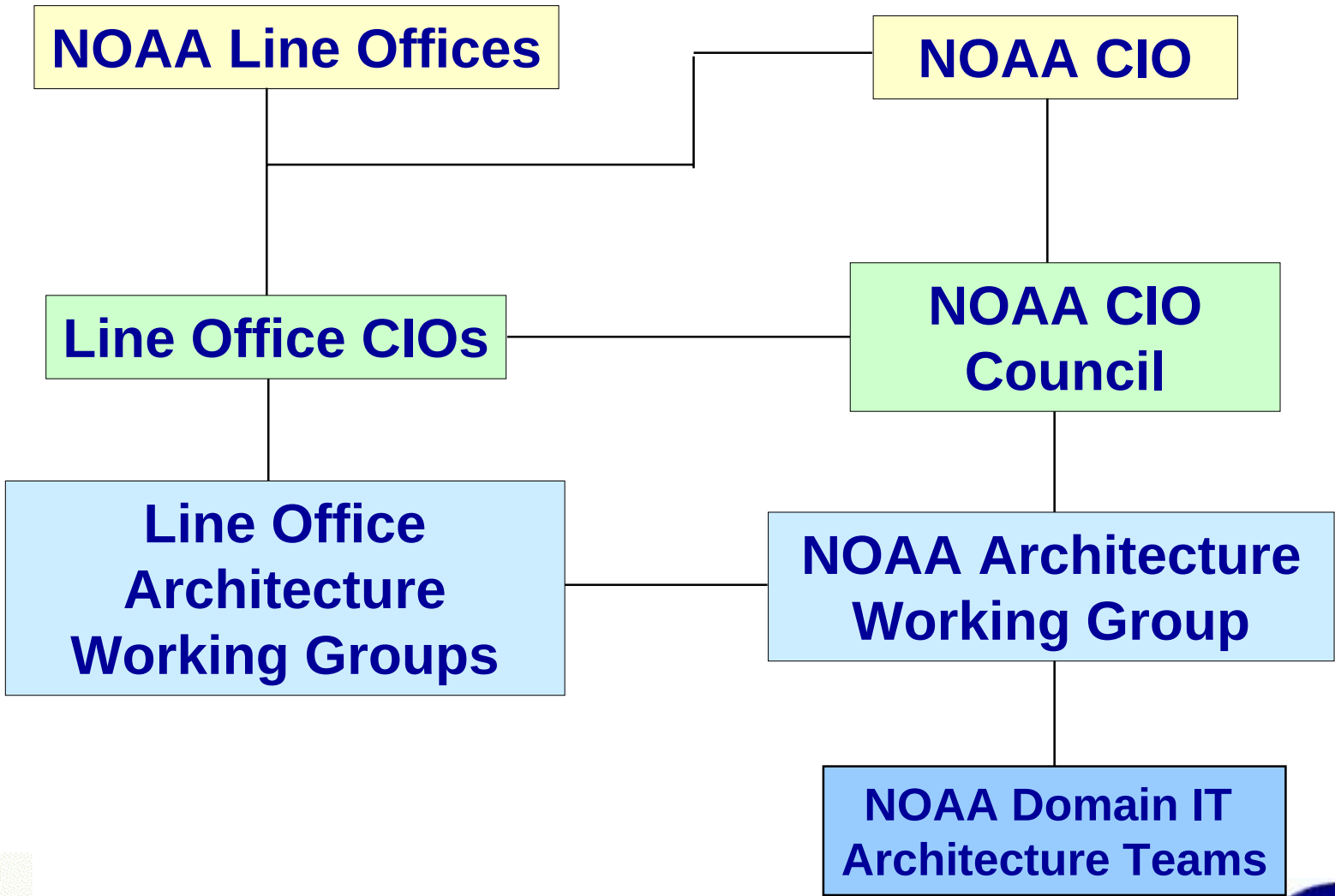

NOAA AWG Roles and Responsibilities

Purpose - From NOAA AWG Charter

- Serve NOAA's CIO and CIO Council in a technical and advisory capacity on the subject of IT Architecture
- Perform tasks specifically assigned by the NOAA CIO Council
- Make recommendations and provide advice to the CIO Council with respect to policy, procedures, standards, and investments
- Promote the adoption and implementation of IT architectural practices throughout NOAA

NOAA AWG Roles and Responsibilities

Purpose - From NOAA AWG Charter (Cont'd)

- Develop and maintain a NOAA IT Technical Reference Model and Standards Profile
- Guide and assist the NOAA IT Architecture Domain and Segment Teams in development of IT Architecture(s)
- Monitor the update of the IT Architecture domains (cross-cutting architectures)
- Share experiences, ideas, and successful practices among group members

NOAA IT Principles

- Meta Principles
- Business Process Principles (NOAA's Mission)
- Data Principles
- Application Principles
- Technology Infrastructure Principles

NOAA IT Principles - Meta

- **M.1. IT Decisions Will Be Driven by Total Business Worth to NOAA**
- **M.2. NOAA will make use of vendor-neutral (e.g., TCP/IP or Bluetooth) and vendor-specific (e.g., Microsoft Windows) standards,** where practical, to develop interoperable and open systems.
- **M.3. Security** is essential and appropriate security will be provided for NOAA networks, servers, computers, and data/information.
- **M.4. Electronic Accessibility of Services and Products** will be provided in accordance with Federal law for persons with disabilities.
- **M.5. Training** is essential to retain personnel, and to make effective use of IT systems and resources NOAA will attempt to coordinate the provision of state-of-the-art training anytime and anywhere through the use of Internet and other electronic means.
- **M.6. The IT Architecture will be regularly updated** to reflect changes in strategic goals, business needs, and technology.

NOAA IT Principles -Business Process

- **B.1. Accomplishment of NOAA's mission is critically dependent on a sound IT infrastructure.**
- **B.2. Business Processes will be optimized** through appropriate use of digital workflow technologies.
- **B.3. Appropriate Access to resources** will be provided independently of location or organization.
- **B.4. Partnerships** with constituents and collaborators in academia, industry and other agencies will be fostered and encouraged.

NOAA IT Principles - Data

- **D.1. Data Is a Corporate Resource** and will be managed effectively and efficiently, made available, and archived in accordance with Federal Regulations.
- **D.2. Metadata** will be developed and maintained.
- **D.3. Data will be entered and captured only once.**
- **D.4. Data will be kept Separate from Applications.**
- **D.5. Data will be Online** to the extent feasible and appropriate.

NOAA IT Principles - Applications

- **A.1. User requirements** will drive application development.
- **A.2. Process Re-engineering or Simplification** will be evaluated before buying or developing applications for a process.
- **A.3. Off-the-Shelf Software** will be used in preference to home-grown solutions when it can meet requirements.
- **A.4. Application development** will use proven software engineering methodologies to develop, re-engineer, maintain and implement applications.
- **A.5. Security, networking, scalability, modularity and platform independence** will be critical design elements.
- **A.6. Documentation** of all applications will be provided and maintained.

NOAA IT Principles - Technology Infrastructure

IT Architecture

- **T.1. NOAA will provide a common network environment** with adequate bandwidth, using a standard set of protocols, to support NOAA's network services.
- **T.2. The Internet/Web** will be a key element in acquiring, transmitting, and sharing NOAA data and information. NOAA seeks standard and easier ways to access increasingly complex technologies and information.
- **T.3. Messaging** is critical to NOAA's day-to-day business operations and must be reliable, accessible, secure, must provide electronic forms for collaboration, and must provide a robust corporate directory.
- **T.4. Technologies** will be chosen to enhance mission capabilities, to improve customer service, and to support scalability, portability, operability, compatibility and evolutionary changes.

NOAA IT Principles - Technology Infrastructure

- **T.5. Emerging technologies will be evaluated in pilot projects** before using them in critical and/or operational systems**.** Technologies may be adopted if proven effective and efficient in pilot demonstrations.
- **T.6. High Performance Computing** will be used to meet NOAA's requirements for increased high-end computing resources for higher resolution models and for improved representation of the physics, chemistry, and biology of environmental systems, and to help manage and process the rapidly increasing amounts of data available and necessary to run the models.

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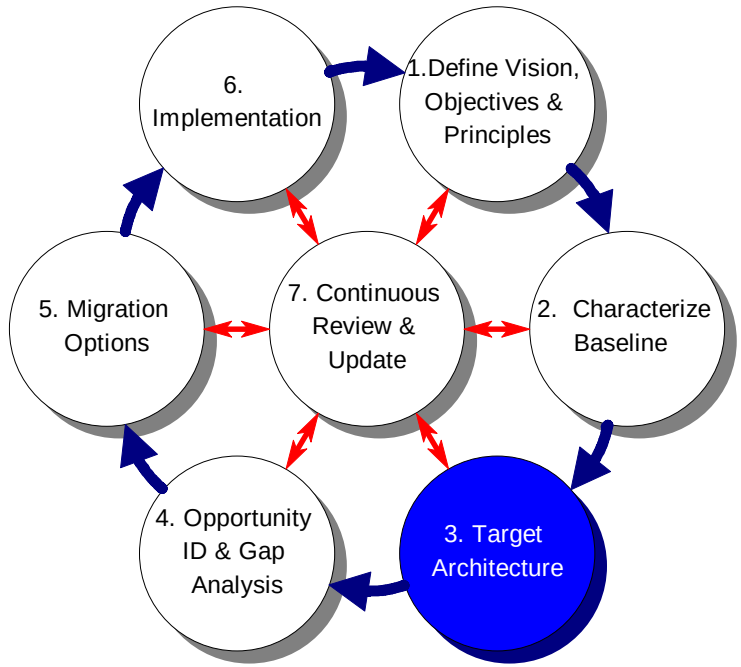
- Lessons Learned

3. Create IT Target Architecture

- Model each view separately
- Identify the Technology Drivers
- Create a Target Architecture for each of the four IT Architecture views.
- Synthesize four views into a comprehensive Target Architecture
- **Develop Technical Reference Model and Standards Profile**
- ***Deliverables**:*
  - *Target Architecture Document*
  - ***Technical Reference Model & Standards Profile, First Edition***



Technical Reference Model and Standards Profile

Technical Reference Model (TRM)

- Defines the building blocks for developing an Information Technology (IT) Architecture
- Provides a common conceptual framework
- Defines a common vocabulary
- Provides a set of service definitions and relationships
- Based on “NIST Special Publication 500 B 230, Application Portability Profile, Version 3.0”
- Describes the main elements of a complete IT system as a set of IT Services

Technical Reference Model and Standards Profile

- **IT Service Category**
  - Higher level abstraction that consists of a collection of service components organized **to accomplish a specific function or set of functions**.
- **Service Components**
  - Made up of **standards, interfaces, protocols and product specifications**
- Identified **eleven** IT Service Categories

Technical Reference Model and Standards Profile

IT Service Categories

- Security
- Networking
- Operating System
- User (Person)/Computer Interface
- Data Management
- Data Interchange
- Multimedia/Graphics
- Communications
- Document Management
- Support
- Hardware

Standards Profile

- **Provides a framework** for specifying standards, interfaces and protocols for service components
- **Services column** identifies the Service and the Service Components
- **Standards/Protocols column**
  - Vendor-neutral standards
  - Vendor-specific standards
  - Interfaces
  - Protocols
  - Product specifications

Standards Profile

- **Implementation Level column** indicates the level of compliance or adoption for the invoked standard, protocol or interface
- Classifications Levels
  - Mandatory
  - Recommended
  - Emerging
  - Obsolete

Standards Profile Format

Services	Standards/ Protocols	Implementation Level
Networking Services		
Network Management Address Management IP Suite Routing Protocols		

Standards Profile Format

Services	Standards/ Protocols	Implementation Level
Security Services[1]		
•Identification, Authentication, and non-repudiation •Audit Trail Creation and Analysis •Access Controls •Cryptography Management •Virus Protection •Fraud Prevention •Detection and Mitigation •Intrusion Prevention and Detection		

[1] From OMB Circular A-130 Paragraph 8.b.(2)(c)(iii)

Standards Profile Format – Sample Write-up

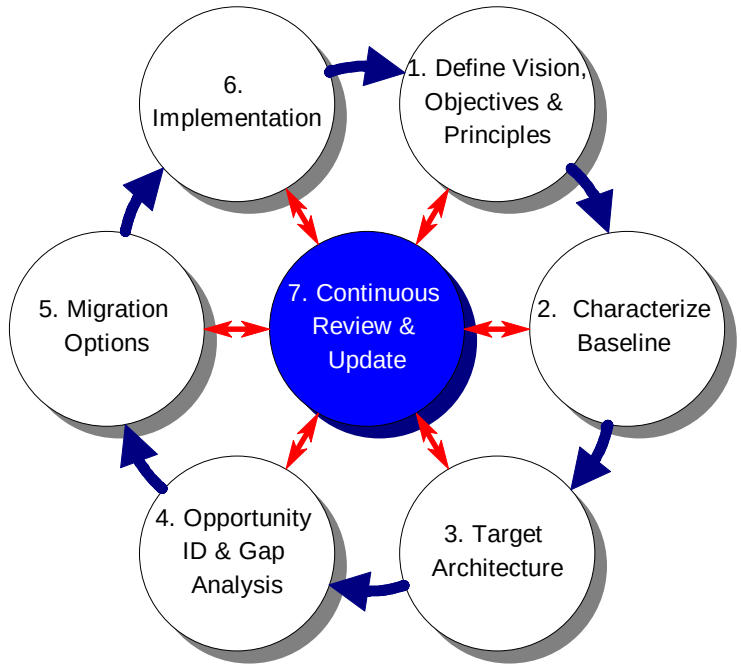
- **TCP/IP Implementation**: TCP/IP and its suite of protocols (IETF Implementation STD5, STD7)
- **Implementation Level**: Mandatory adoption
- **Description**: TCP/IP is a well-established, widely adopted industry standard communications protocol. It is the primary means of communications throughout the Internet. TCP/IP provides for a reliable, connection-oriented, end-to-end transport service on top of an unreliable network…. The new generation IP (IP Version 6 - also known as IPng) will alleviate the address depletion problems.
- **Rationale**: Adopting TCP/IP network protocol will simplify communications and data exchange … TCP/IP is supported by almost every supplier of communications products.
- **Implications**: TCP/IP can be used over almost any kind of network to provide quality end-to-end transmission service.

Outline

- What is an IT Enterprise Architecture?
- Department of Commerce IT Architecture
- DoC Technical Reference Model and Standards Profile
- **DoC IT Architecture Capability Maturity Model**
- Lessons Learned

7. Continuously Review and Update IT Enterprise Architecture

- Adjust the IT Enterprise Architecture decisions for unforeseen changes
- Make adjustments based on experience
- Ensure modifications reflect a realistic approach
- **Can cause a reentry into the process at any point**
- Update IT Architecture, annually



IT Architecture Capability Maturity Model

- Ensure that the Department continues to build on IT Architecture efforts and fully realizes the benefits
- Assess IT processes
- Ascertain where we are and where we should be headed within the organization
- Enhance the overall odds for success
- **CIOs use as a self-assessment tool**
- Identify weak areas and provide a defined path towards improvement.
- **As the Architecture matures it should increase the benefits it offers the organization**

IT Architecture Capability Maturity Model

- **Tools**
  - Department of Commerce (DoC) IT Architecture Maturity Model
  - Characteristics of DoC Operating Units' IT Architecture Processes at Different Maturity Levels
  - DoC IT Architecture Capability Checklist
- **Maturity Level**
  - 0 No IT Architecture Program
  - 1 **Initial** - Informal IT Architecture Process Underway
  - 2 IT Architecture Process Is **Under Development**
  - 3 **Defined** IT Architecture Including Detailed Written Procedures and TRM
  - 4 **Managed** and Measured IT Architecture Process
  - 5 **Optimizing** - Continuous Improvement of IT Architecture Process

DoC IT Architecture Capability Maturity Model[1]

Level	Focus	Characteristics
3	**Defined** IT Architecture Including Detailed Written Procedures and Technical Reference Model	The architecture is well defined and communicated. The process is largely followed. **Gap Analysis, Migration Plan, Technical Reference Model, Standards Profile, and Migration Plan are completed**. Cost-benefits are considered in identifying projects. IT goals and methods are identified. Training and awareness programs provided at regular intervals. **IT Architecture is integrated with strategic planning and budgeting processes.**

[1] Meta Group, Inc. "Enterprise Process Maturity Model and the SEI Model©, Enterprise Architecture Strategies, File 16, July 28, 1998

Characteristics of DoC Operating Units' IT Architecture Processes at Different Maturity Levels[1]

- Business Linkage
- Senior-Management Involvement
- Operating Unit Participation
- Architecture Process Definition
- Architecture Development
- Architecture Communication
- Governance
- Program Management
- Holistic Enterprise Architecture
- IT Investment, and Procurement Strategy

[1]Meta Group, "Enterprise Process Maturity Model and the SEI Model", Enterprise Architecture Strategies, File 16, July 28, 1998

Characteristics at Different Maturity Levels

Characteris-tics	Level 0: No Architecture	Level 1: Initial	Level 2 Under Develop-ment	Level 3: Defined
Architecture Development	No architecture at all.	No architecture to speak of. Some standards, established by a variety of ad hoc means.	Architecture standards exist, but not necessarily linked to overarching conceptual architecture. Technical Reference Model (TRM) and Standards Profile framework established.	Architecture standards development linked to business drivers via conceptual architecture of principles and best practices. Partially completed TRM and Standards Profile.

IT Architecture Maturity Model Checklist[1]

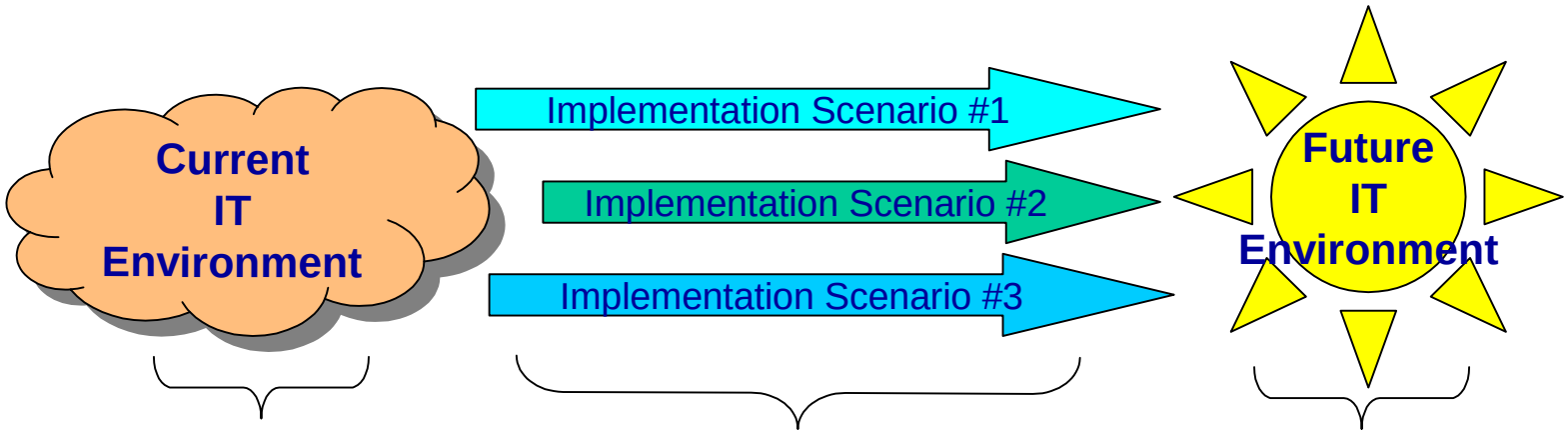
Checklist Item	Current FY 2001	Next FY 2002
Business Linkage: To what extent is the business involved in the definition of an Enterprise Architecture (EA) process in the organization?		
Senior Management Involvement: To what extent are the senior managers of Operating Unit involved in the establishment and ongoing development of an EA process?		
Operating Unit Participation: To what extent is the definition of the EA process accepted by the Operating Unit?		
Architecture Development: To what extent is the architecture development in the organization driven by a well established process?		

[1]Meta Group, "Architecture Maturity Audit: Part 2", Meta Practice, Volume 4, Number 5, May, 2000.

IT Architecture Capability Maturity Model (ACMM) at NIST

- Used to develop NIST Information Technology Architecture Plan (ITAP)
- Effective method of evaluating the “as-is” IT environment at NIST
  - Initial assessment
  - On-going review
- Currently ITAP Contractor using the ACMM checklist as one of the first steps in their analysis
- ACMM results will form the basis for specific recommendations
- All ITAP scenarios presented to NIST will discuss their impact on the ACMM
- IT ACMM will be an integral part of the on-going NIST IT environment.

ACMM Used throughout the NIST ITAP Project



Used to assess the current technical environment

- Various implementation scenarios will dictate how ACMM issues are addressed.
- Each scenario will address ACMM deficiencies identified during the assessment of the current environment.

ACMM model will continue to be used to evaluate the evolving IT environment.

Using the ACMM in Conducting the NIST ITAP

IT Architecture

Going through the checklist in the early stages of the project, allowed the NIST ITAP team to adjust their project approach.

✓ Checklist item: **business involvement** = initial score of **1.0**

Prompted the ITAP team to conduct additional interviews with business staff & resulted in:

✓ Checklist item: **business involvement** = current score of **3.0**

Lessons Learned at NIST – Using ACMM in Developing ITAP

- **Provides insight into the scope of the project**
  - Used when assessing an organization's level on the ACMM
  - Accomplished before an ITAP project begins
- **Assists in developing project tasks and assumptions**
  - Identified during investigation of ACMM Characteristics including, business linkage, senior management involvement, Operating Unit participation, etc.
- **ACMM checklist provides further detail of areas to be addressed during the ITAP**
  - Compared current organization against the checklist
  - Checklist review enabled early identification and remediation of specific organizational weaknesses as the ITAP was being developed

Outline

- What is an IT Enterprise Architecture?
- Department of Commerce IT Architecture
- DoC Technical Reference Model and Standards Profile
- DoC IT Architecture Capability Maturity Model
- **Lessons Learned**

DoC Affinity Group Assumptions: Success Factors

- Identify **quick win** situations to build support and show value
- Agree on **mandatory (foundation) standards** and key information & communication **interfaces**
- Develop a **common vision** among senior management on the business and role of IT within the Department
- Derive IT Architecture from Department's **Strategic & Business Requirements**
- Develop and maintain IT Target Architectures at the **Business Unit level**
- Gain understanding that IT Architecture is a **long term process**
  - No immediate requirements for business units to change their systems

Potential Risks

- **High Risk**
  - Federal CIO Council estimates only 20% of efforts produce real benefits
- **Problem defining the proper scope of efforts**
  - Increases risk of failure
  - Overwhelming
  - Fear of starting
- **Enforcement difficulty**
  - Will fail unless IT Architecture enforcement is done at low levels or in strongly centralized organization
- **Inflexible IT Target Architecture**
  - Do not meet programmatic needs
  - Stifles innovation

Potential Benefits

- Make the flow of information and data easier
- Improve ability to communicate to the outside
- Ensure IT Infrastructure works and continues to work with rapidly increasing change
- Result in substantial cost reductions in IT procurements and support through standardization
- Create more efficient business processes
- Facilitate support for budget approval through OMB and Congress
  - **OMB withheld $400M from INS because the Bureau did not have an IT Architecture Plan**

DoC IT Architecture Efforts Inventory: Preliminary Findings

- Pockets of excellence exist throughout the Department
- Some organizations have done extensive IT Architecture work
- Mix between in-house development and working with outside contractors
- For those completed or underway, scope and effort match the guidance from the Federal Enterprise Architecture Conceptual Framework
- Benefits most indicated
  - **Improved business process**
  - **Easier to plan future IT actions and activities**

Lessons Learned (Top Five)

- There must be a **shared and mutual vision** with senior managers on the role of the IT Architecture within the Bureau
- Must be in alignment with the Agency's **strategic plan and business requirements**
- Defined by **IT Principles and Standards**
- Critical to **learn** about IT requirements & IT successes and failures **from all levels of the organization**
- Great **flexibility and creativity** are required to modify the process so that it works for your organization.
  - Requires **continuous review and update**

Lessons Learned (Continued)

- An orderly and systems approach must be used to develop the IT Enterprise Architecture
- An Internet Home Page is an excellent communications tool
- Invaluable using in-house staff and for owner to take the lead directly
- Important to involve as many IT and business staff in the process, as practicable
- Quick win situations should be identified early on and implemented but may be elusive

Lessons Learned (Continued)

- Must begin with a clear definition and understanding of the Organization's vision, IT Principles and business context
- Multi-organizational collaborative efforts can be very effective and successful
- The IT Enterprise Architecture process is much more important than the IT Architecture Plan. Technology and business drivers can rapidly change.
- **Nontechnical challenges are greater** than the technical challenges.
- **JUST DO IT!**

Contact Information

- Department of Commerce IT Architecture Affinity Group
  - **http://www.hpcc.noaa.gov/docita**

- Ira Grossman
  NOAA
  (301) 713-3345 x113
  ira.m.grossman@noaa.gov

Questions and *Hopefully* Answers

IT Architecture